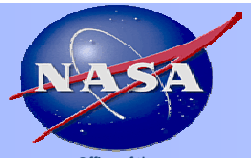

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One NASA Cost Engineering Database (ONCE)

Overview & Update

2019 NASA Cost Symposium

NASA: James K Johnson and Eric Plumer

SAIC: Mike Blandford and Julie McAfee

Main Presentation Agenda

- **ONCE and CADRE Background**
  - Brief overview
- **By the Numbers**
  - CADRe Dashboard, Download Dashboard, User Dashboard, and Model Downloads
  - Numbers Summary
- **ONCE Enhancements**
  - Schedule Files
  - AWS Migration
  - Crewed Database
  - Additional Data Improvements and Fixes
- **In-Progress Efforts**
- **Conclusion**

ONCE Breakout Session:
Thursday from
0915 to 1015hrs at
Mercury

Note: Numbers shown current as 22 July 2019

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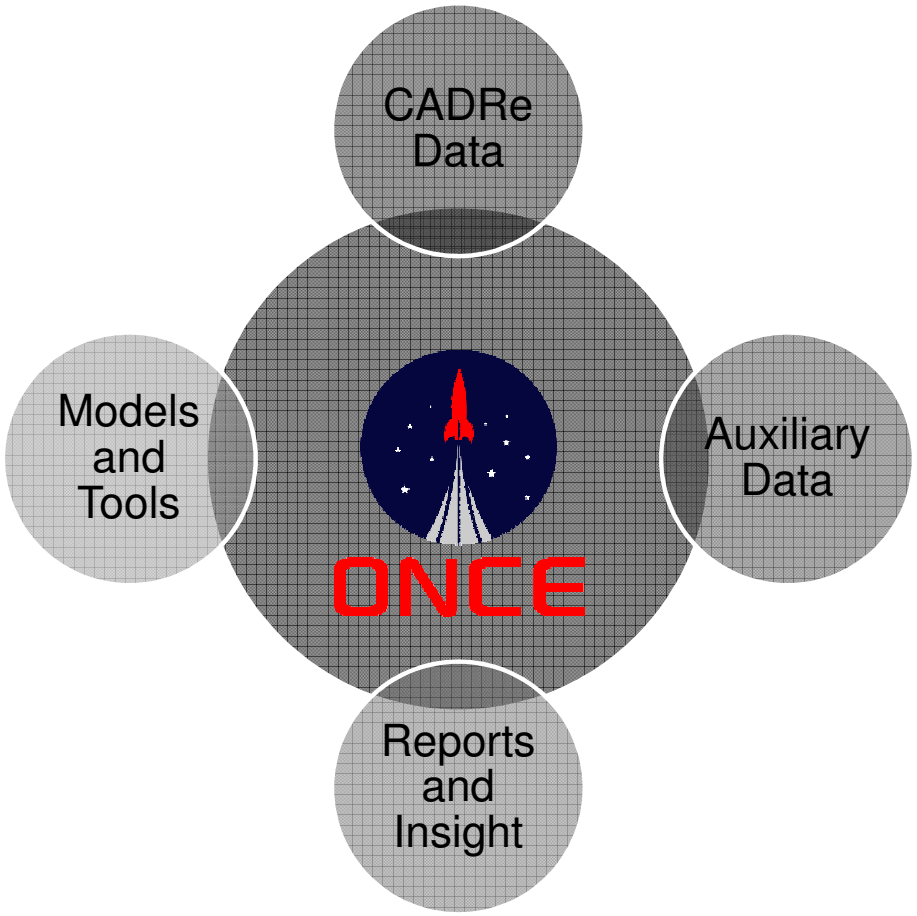
Last Time(s)…



- ONCE 2.0 is a significant improvement and puts the database at the center of OCFO SID efforts to build and improve the NASA community.
- ONCE is now the center of OCFO SID's efforts to empower analysts and improve cost estimating at NASA by providing access to:

- **CADRe Data**
  - Active filtering for custom user reports
  - CADRe Library
- **Auxiliary Data**
  - Normalized datasets
  - OCFO Data
- **Reports and Insight**
  - Dynamic graphical & tabular reports
  - Structured database reporting
- **Models and Tools**
  - Model Portal sharing access across community
  - Online Models

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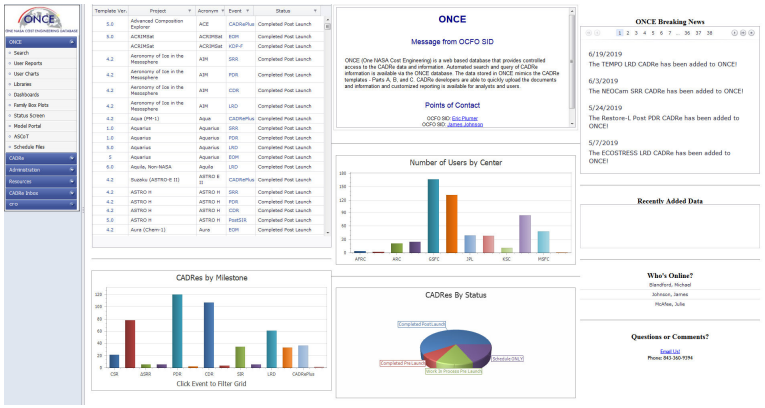
What is ONCE?

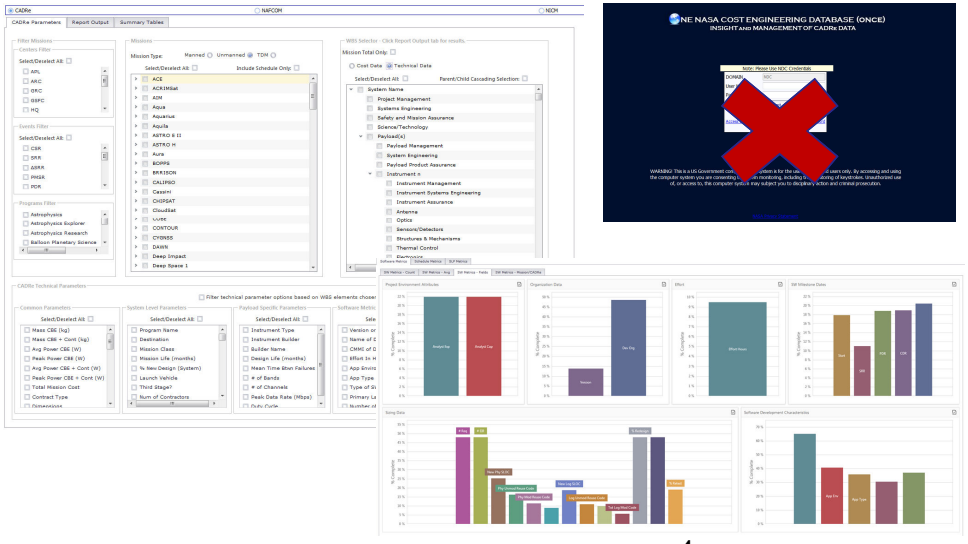
- **The ONCE Database (aka https://oncedata.hq.nasa.gov, aka "ONCE") is a government website managed by HQ OCFO SID that provides access to technical, cost, and other programmatic information about NASA Projects.**

- **The data primarily comes from CADRe documents which have a Part A, B, and C**
  - Part A = Long narrative (MS Word doc)
  - Part B = Technical Data (MS Excel file)
  - Part C = Cost/Programmatic Data (MS Excel file)
  - CADRe is the Agency's formal cost data collection initiative as outlined in NPD 71205.E. CADRe is paid for by SID and performed during KDP's on Projects.

- **The website provides a user interface to search and retrieve data from the CADRe's**
  - Enables analysts and estimators to quickly build analogy datasets, perform historical analysis, develop cost estimating relationships, etc.

- **Users can output the data retrieved from ONCE to MS Excel for their own specific analysis needs**
  - Project estimation, independent estimation, research, proposal development, etc.





ONCE BY THE NUMBERS

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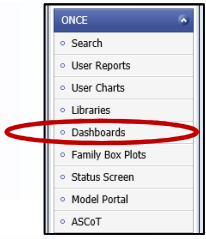
CADRe Dashboard



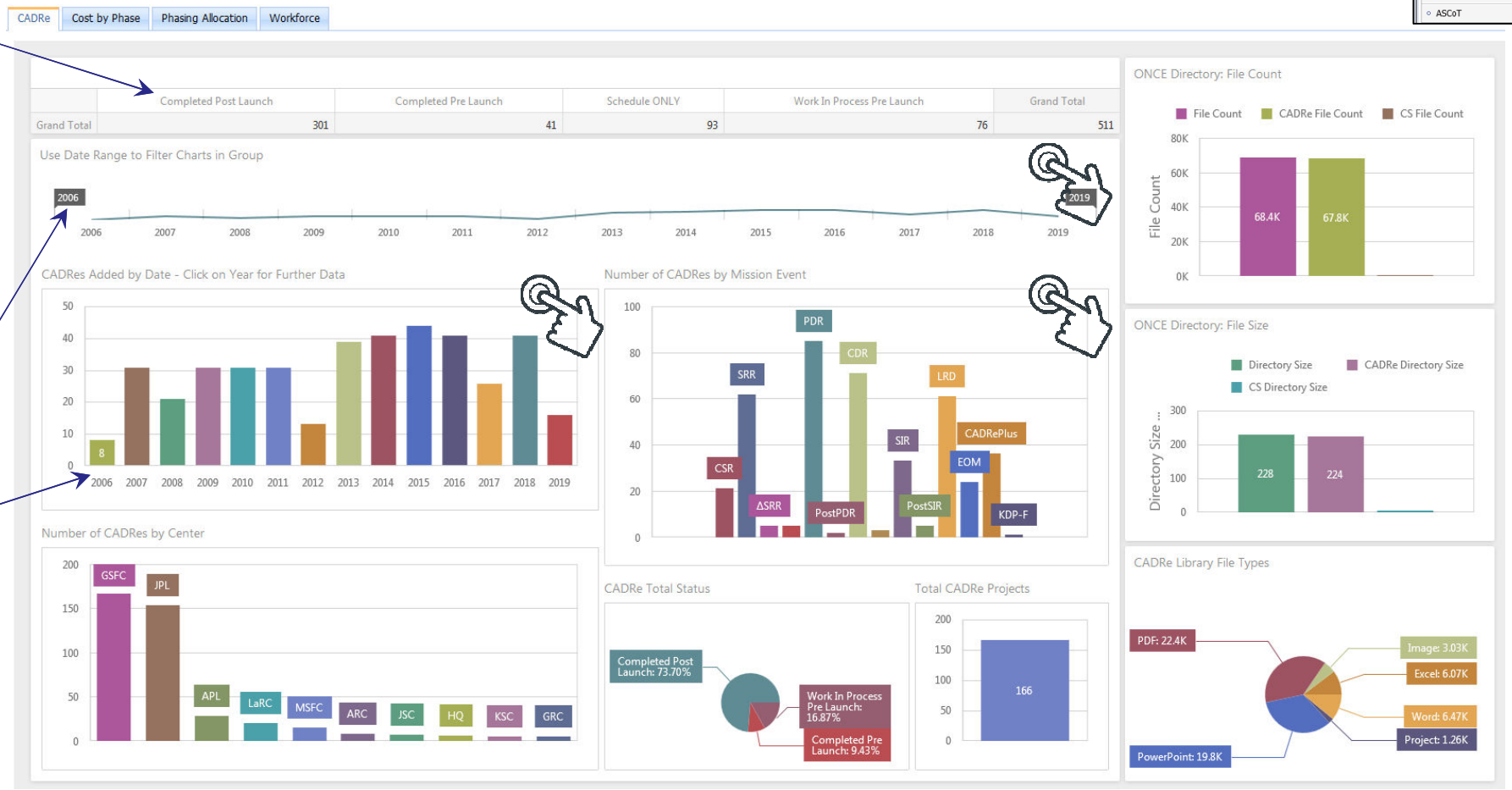
511 Total CADRe's, 301 Completed Post-Launch

Click Flags to filter Timeline

CADRe's Added by Year

228GB 68K Files!

= clickable for users



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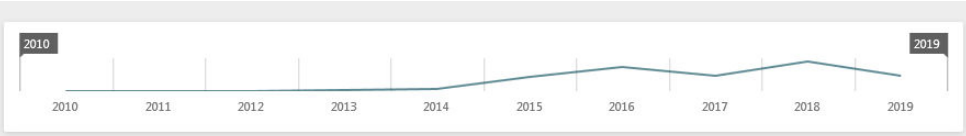
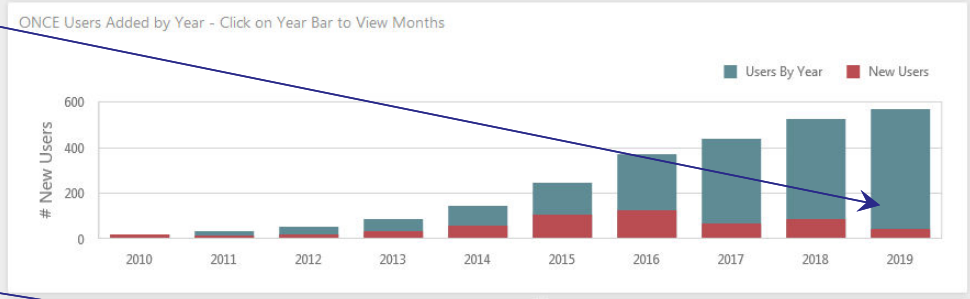
User Dashboard

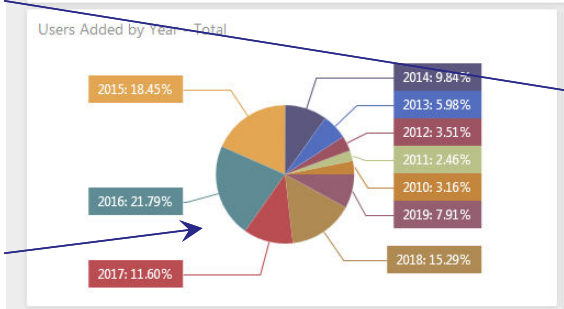
569 Total Users (+45 in 2019)

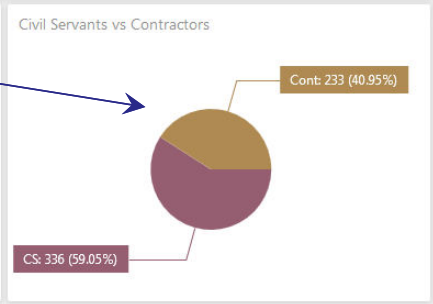
59% CS / 41% Cont

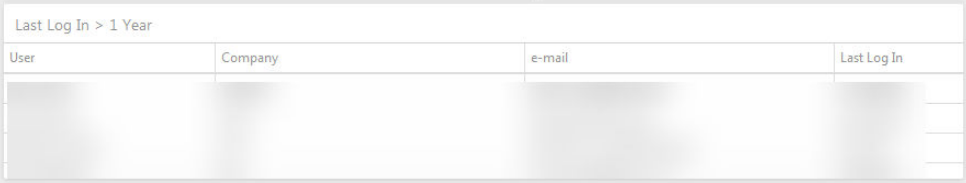
Average Yearly Growth 15% (last 5 years)

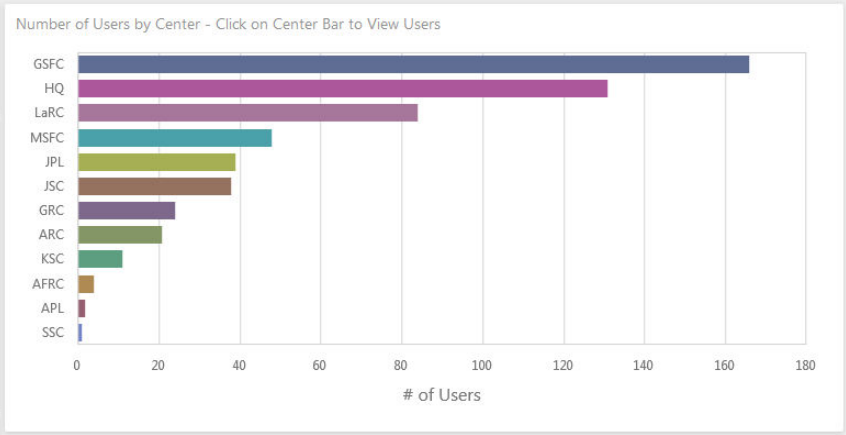


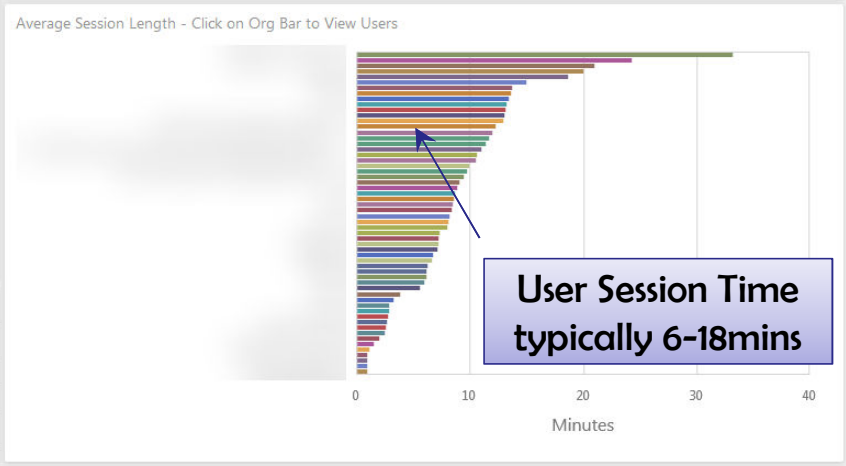












User Session Time typically 6-18mins

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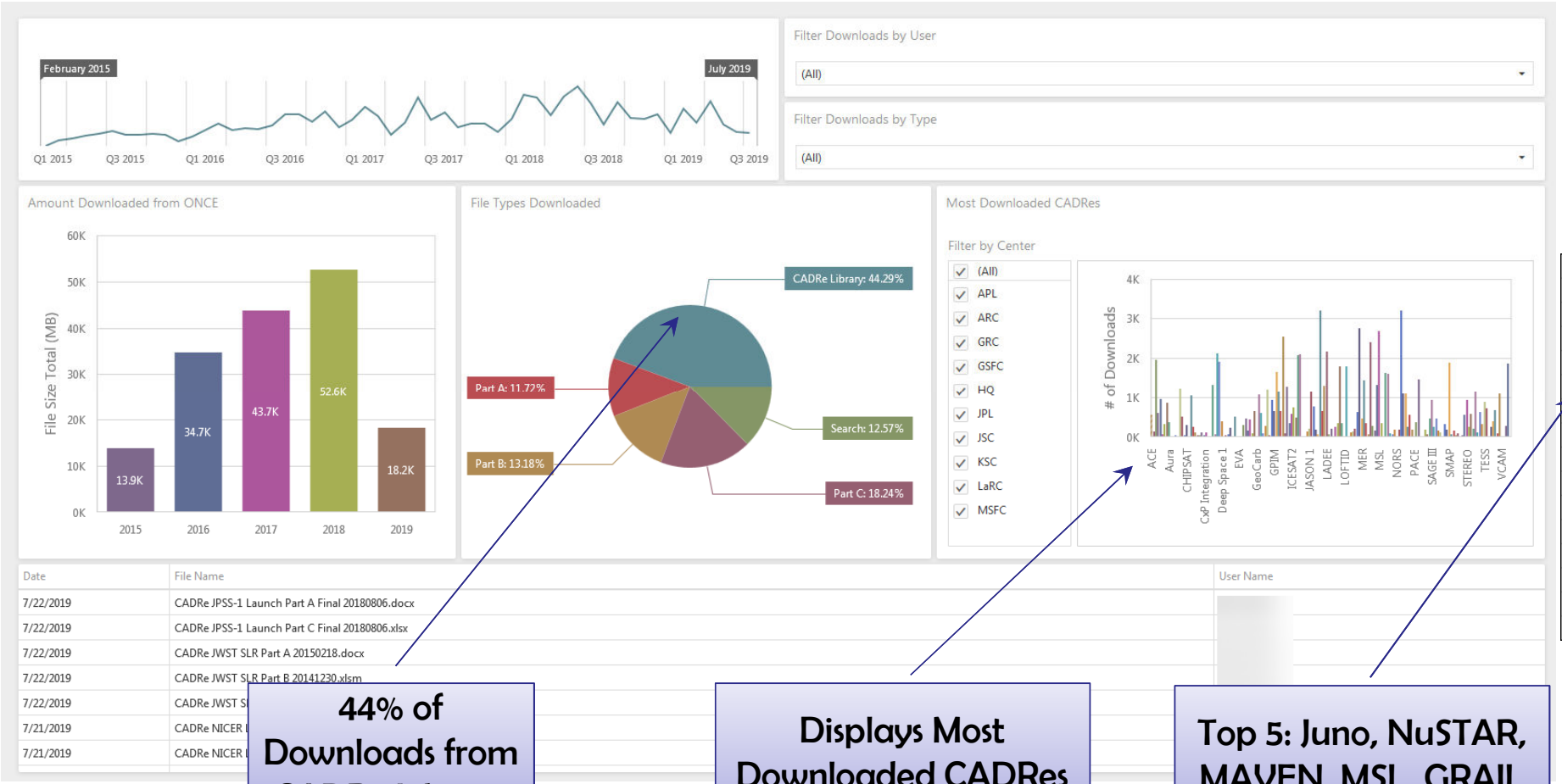
Downloads Dashboard



Name	Downloads
Juno	3204
NuSTAR	3192
MAVEN	2760
MSL	2680
GRAIL	2538
MMS	2394
LADEE	2165
DAWN	2130
IRIS	2105
InSight	2076
AIM	1956
Deep Impact	1905
SMAP	1890
WISE	1870
LRO	1808

44% of Downloads from CADRe Library

Displays Most Downloaded CADRes

Top 5: Juno, NuSTAR, MAVEN, MSL, GRAIL

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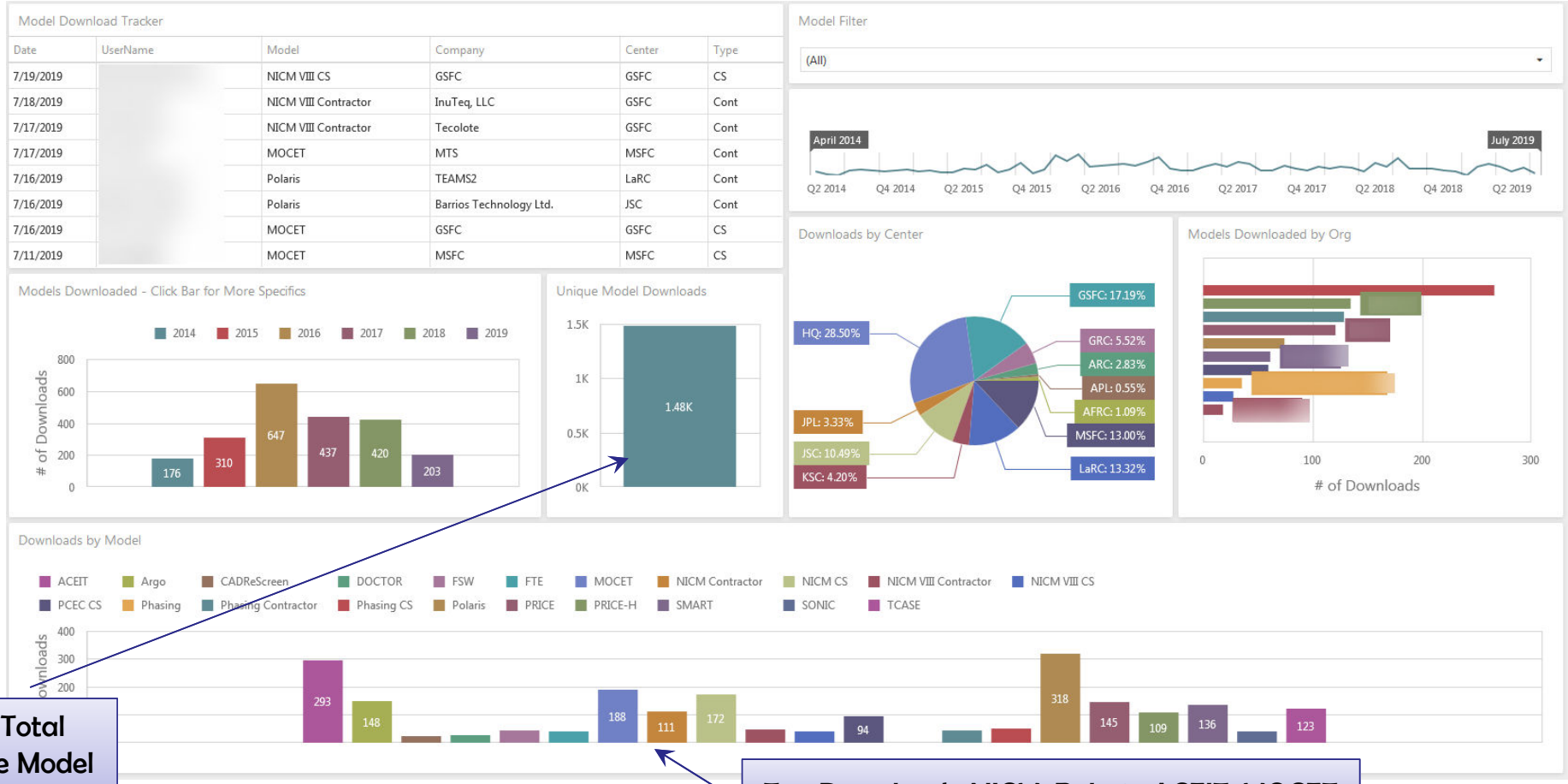
Model Downloads



1481 Total Unique Model Downloads

Top Downloads: NICM, Polaris, ACEIT, MOCET

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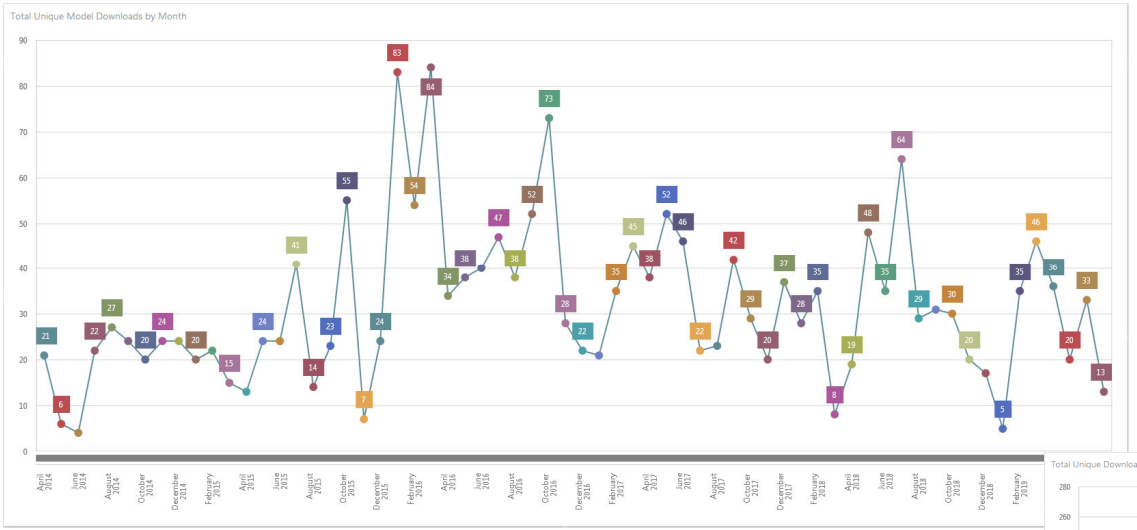
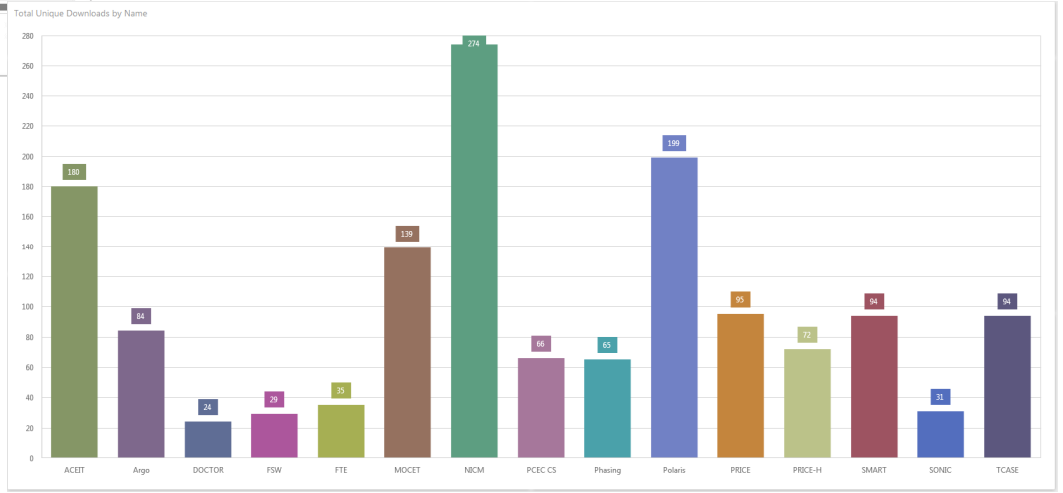
Total Unique Model Downloads



- **Top Unique Downloads:**
  - NICM* (274) (*Includes CS + Contractor)
  - Polaris (199)
  - ACEIT* (180) (*Includes JACS)
  - MOCET (139)
  - PRICE (95)
  - SMART (94)
  - TCASE (94)



- **1481 Total Unique Model Downloads**
  - Monthly totals shown above
- **Model Download trend is consistent over 2-3 years**
  - Last 12mo High = July 2018, 64 downloads
  - 2019 High = March 2019, 46 downloads
  - Avg Monthly Downloads (All Time) = 31
  - Avg Monthly Downloads (Last 12mo) = 29
  - Number of Months Open = 64
- **Updates to the Model Portal drive download spikes**

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ONCE Numbers Summary

- **Total CADRe = 511**
  - 2019 = +16, 2018 = +41, 2017 = +26, 2016 = +41
- **Total Projects = 166**
  - 2019 = +9, 2018 = +15, 2017 = +9
- **Total Users = 569**
  - 2019 = +45, 2018 = +87, 2017 = +70, 2016 = +138
- **Total Size = 68k (+5k) documents and 228GB (+10GB)**
  - CADRe Library and Symposium Library most popular
- **Total Model Downloads = 1481**
  - Top Models are: NICM, Polaris, ACEIT, MOCET, PRICE

ONCE 2019 ENHANCEMENTS

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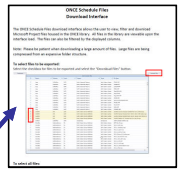
Improved Schedule File Access

- New main menu item: **Schedule Files**
  - Provides new interface that improves user ability to access and filter schedule files
- **1255 Schedule Files**
- Filter by Mission name, Milestone, Center, Program, or Theme
- Select and download multiple files at the same time
- Instructions PDF included



Instructions

Users can easily Filter or Search in any column

Download Files

Download multiple files at same time

ONCE
- Search
- User Reports
- User Charts
- Libraries
- Dashboards
- Family Box Plots
- Status Screen
- Model Portal
- ASCoT
- Schedule Files

ONCE Schedule Files

Mission	Milestone	Center	Program	Theme	File Name
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	CDHBL.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	COMBL.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	ediedsbl.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	EPSBL.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	Flag10EDS.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	Flag10it.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	Flag10SPA.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	GNCBL.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	Option1replanwBaseline.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	PROPBL.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	Strucbl.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	SWBL.MPP
Aqua	CADRePlus	GSFC	Earth Systematic Missions	Earth Science System	THERMBL.MPP
CALIPSO	LRD	LaRC	Earth System Science Pathfinder	Earth Science System	CALIPSO Launch Campaign Schedule May-05 to LAUNCH.mpp
CALIPSO	LRD	LaRC	Earth System Science Pathfinder	Earth Science System	CALIPSO Payload Schedule March 1999 to March 2002 Replan.mp
CALIPSO	LRD	LaRC	Earth System Science Pathfinder	Earth Science System	CALIPSO Payload Schedule March 2002 to January 2003 Delivery
CALIPSO	LRD	LaRC	Earth System Science Pathfinder	Earth Science System	CALIPSO Satellite AIT Schedule Feb-03 to May-05.mpp
CHIPSAT	CADRePlus	GSFC	Astrophysics	Astrophysics	CHIPS schedule-040901.mpp
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	BATC Dec 02.mpp
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	CPR_10_GSE.mpp
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	CPR_11_MechEngr.mpp
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	CPR_2.1_Mgmt.mpp
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	CPR_2.2_I&T.mpp
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	CPR_3.1&3.2_SysEng.mpp
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	CPR_3_CSA_Receiver.mpp
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	CPR_4_Antn_QOTL.mpp
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	CPR_5.1_EIK.MPP
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	CPR_5.2_HVPS.mpp
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	CPR_5.2_Thermal Rework.mpp
CloudSat	AdditionalSource	JPL	Earth System Science Pathfinder	Earth Science System	CPR_6_RFES.mpp

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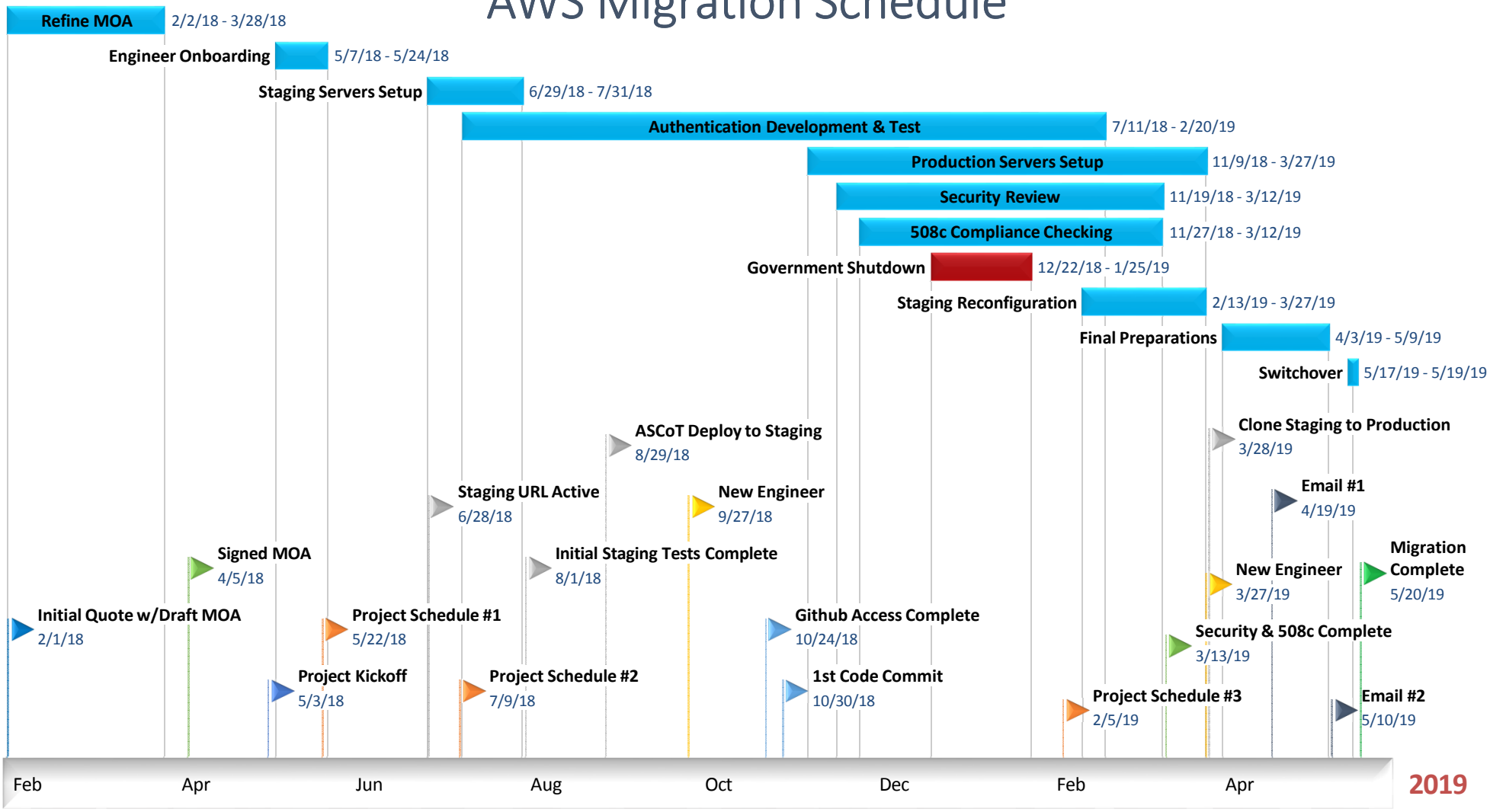
AWS Migration Complete - Benefits

- **ONCE alignment with NASA server consolidation efforts**
  - Migration to cloud services Government & Industry-wide
- **Lower annual operating costs**
  - HQ MCE is managed by HQ ITCD with AWS infrastructure
- **Expanded infrastructure**
  - Local + Staging Servers + Production Servers + Repo
- **Improved performance**
  - Staging and Production servers tech spec improvements
- **Robust security**
  - Inherit HQ MCE Security Plan with 24/7 monitoring
- **New capabilities**
  - Ability to add new servers with OS & applications
  - Purchase and leverage S3 storage

ONCE - HQ MCE AWS

EC2 Staging	t2.medium
EC2 PROD	m4.large
Availability	>=99%
Recovery	3-6 Hrs
Support	24/7
Licenses	Included

AWS Migration Schedule



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AWS Migration Lessons Learned

- Total Migration Duration:
  - Formulation to End: 19 months
  - Initial Quote to End: 15 months
  - Signatures to End: 14 months
- Schedule Growth
  - ~250% from Contractor estimate
  - ~40% from Government estimate
  - IT Industry Avg* ~33% to 74%
- Cost Growth
  - ~50% due to extension of dual-path strategy into calendar year 2019
- Issues identified by Contractor:
  - Staff turnover
  - Lacking repeatable processes
  - Lacking MCE documentation
  - Not all tasks identified
  - Incorrect implementation timelines
  - Lacking cloud technology education
  - Not accounting for delays

Accomplishment	Lesson Learned
AWS MCE Access	*Access can take longer than you think…*
Setup Staging	*Staging will go faster than PROD*
Setup Production	*PROD performance not equal to Staging?*
EC2 Server Configs	*Plan for time to perform reconfiguration(s)*
S3 Bucket Utilization	*Permissions and process both important*
AWS toolkit Visual Studio	*Code commit process alignment for MCE*
Link to GitHub	*Fluid process & permissions*
SAML SSO Authentication	*Assume nothing will be provided*
Security Review	*Organizational vs Technical*
508 Compliance	*Details, details, details, and they take time*
New User Docs	*Communicate and prep before the switch*
Dual-Path Strategy	*Mitigate the risk but Work + Oversight x2*

**McKinsey-Oxford, "Forecasting for IT Projects", 2012, and, The Standish Group International, "CHAOS Report", 2015*

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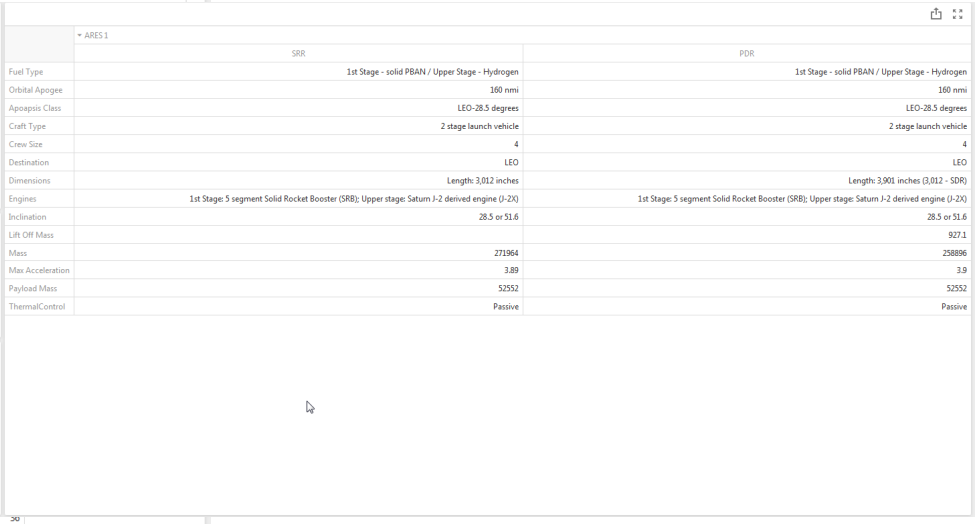
Crewed Database: Progress

DRAFT – Schedule by Phase with User Filters

Mission	Milestone	ATP to SRR	SRR to PDR	PDR to CDR
C2V2	CADRePlus	2	2	12
CxP Ares I	SRR	33	18	17
CxP Ares I	PDR	35	16	17
CxP GO	PDR			13
EVA	SRR		23	25

DRAFT – CADRe Level



	ARES 1	
	SRR	PDR
Fuel Type	1st Stage - solid PBAN / Upper Stage - Hydrogen	1st Stage - solid PBAN / Upper Stage - Hydrogen
Orbital Apogee	160 nmi	160 nmi
Apoapsis Class	LEO-28.5 degrees	LEO-28.5 degrees
Craft Type	2 stage launch vehicle	2 stage launch vehicle
Crew Size	4	4
Destination	LEO	LEO
Dimensions	Length: 3,012 inches	Length: 3,901 inches (3,012 - SDR)
Engines	1st Stage: 5 segment Solid Rocket Booster (SRB); Upper stage: Saturn J-2 derived engine (J-2X)	1st Stage: 5 segment Solid Rocket Booster (SRB); Upper stage: Saturn J-2 derived engine (J-2X)
Inclination	28.5 or 51.6	28.5 or 51.6
Lift Off Mass		927.1
Mass	271964	258896
Max Acceleration	3.89	3.9
Payload Mass	52552	52552
ThermalControl	Passive	Passive

- **Schedule by Phase illustrates durations**
  - ATP to SRR, SRR to PDR, PDR to CDR, etc.
  - Milestone dates from the CADRe Part C

- **CADRe Level supports comparison of data from same Project across various CADRe milestones**

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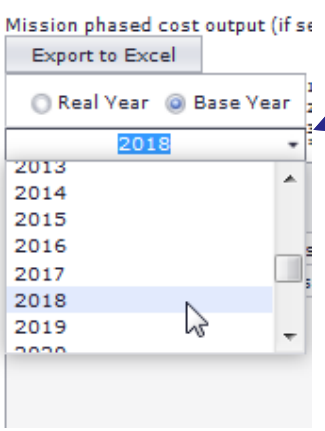
Additional Data Improvements & Fixes

- Inflation user-interface fix for user-selected Fiscal Year
  - ONCE can provide cost output in RY$ or BY$ for users
  - Utilizes the annual NASA New Start Inflation Index (NNSI) to inflate/deflate
  - First iterations of this feature did not include a user selection for FY
  - Drop-down interface for user-selected FY introduced in Fall 2018
  - Issue identified where some user selections could produce incorrect results
  - Implemented fix for all user-selected FY and verified calculations
- Cleanup of Mass values in the database
  - Scrub of detail level and summary total mass values
  - More details available in the CADRe Breakout session
- Instrument Builder improvements
  - Improved Instrument Builder naming convention for up to 3 primary partners
  - Continued cleanup of Builder Type categories
  - Improves output for User Chart on Instruments by Instrument Type
  - More details available in the CADRe Breakout session
- Workforce Data improvements
  - From Status Screen, Workforce Data improvements
  - Interface with annual values and totals across WBS elements (if available)
  - More details available in the CADRe Breakout session



Fix for User-Supplied Fiscal Years

Workforce Data – CADRe Status Screen

Part C:

Description
Project WBS Dictionary
NASA WBS Phased Costs
Cost Assumptions
Work Force Data
Schedule Data
Risk Assessment
Risk Register

		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1. 0	Work Force														
1. 1	Government Personnel Workforce (FTE)								40.3	37.3	10.8	7	7.1	3.7	0.6
1. 1. 1	Project Management								6.4	6.1	0.6				
1. 1. 2	Systems Engineering								3.5	3.3	0.3				
1. 1. 3	Safety and Mission Assurance								0.8	0.8					
1. 1. 4	Science/Technology								4	3.8	4	4	4	3.1	0.6
1. 1. 7	Mission/Flight Operations										2.9	3	3.1	0.6	
1. 1. 8	Payload/ATLAS								22	19.8	2.7				
1. 1. 9	Spacecraft								2.2	2	0.2				
1. 1.10	Ground Systems								1.4	1.5	0.1				

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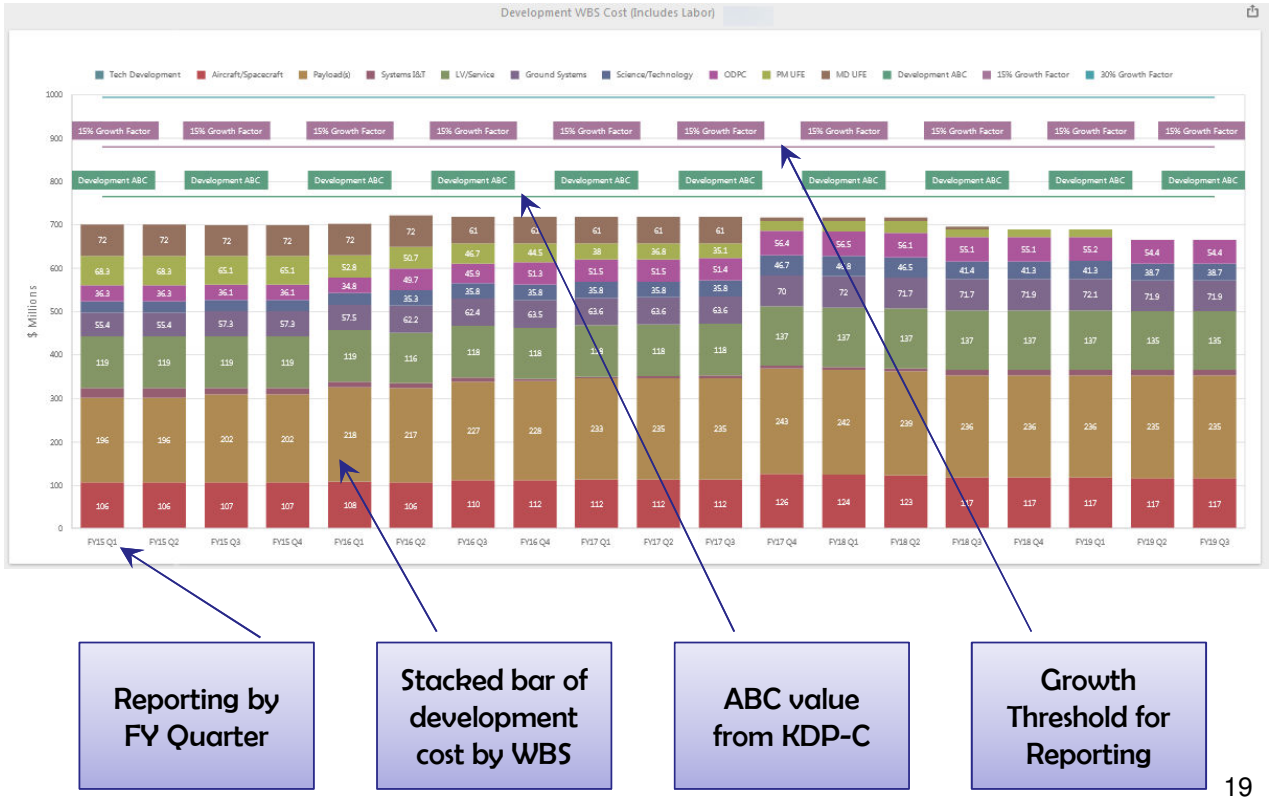
In-Progress Efforts

- **QUIK (QUarterly Information and KDPs)**
  - Enhanced analysis and dashboards to support SID
  - Product outputs to the Monthlies, BPRs, GAO DCIs, and OMB C&S reports
  - Addition of historical datasheets prior to FY2014 to the SQL db
  - Permission structure for non-CFO users
- **ONCE Dashboard Upgrades (Qty 84!)**
  - All ONCE dashboards being upgraded to latest DevExpress controls
  - Features maximize, scroll, etc.

QUIK – Development Cost by WBS vs Reporting Thresholds



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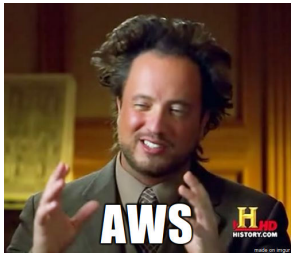
Conclusion

- **ONCE growth reflects the importance of the data to a wide audience:**
  - More than 550 users, ~60% NASA CS
  - 220+GB of data / 68K files
  - 20+ Projects with CADRe's downloaded over 1,000 times

- **Capabilities for users continue to increase:**
  - Human/Crewed database
  - New and updated models/tools for the Model Portal
  - Enhancements to improve data quality and insight

- **AWS Benefits:**
  - Looking forward to taking advantage of these
  - Likelihood to add Servers and S3 storage
  - Make these available to broader community
  - Deploy other cloud-based services



COME TO OUR ONCE BREAKOUT SESSION!

(and also check out the CADRe Breakout Session!)

In the ONCE Breakout Session we are going to:

-Talk about the Crewed Database more

--Show draft Crewed Dashboards and discuss issues

-Hold Open Q&A with ONCE Team

-Data QA trends

-Other "Crowdsource" discussions

-AWS rants and ramblings

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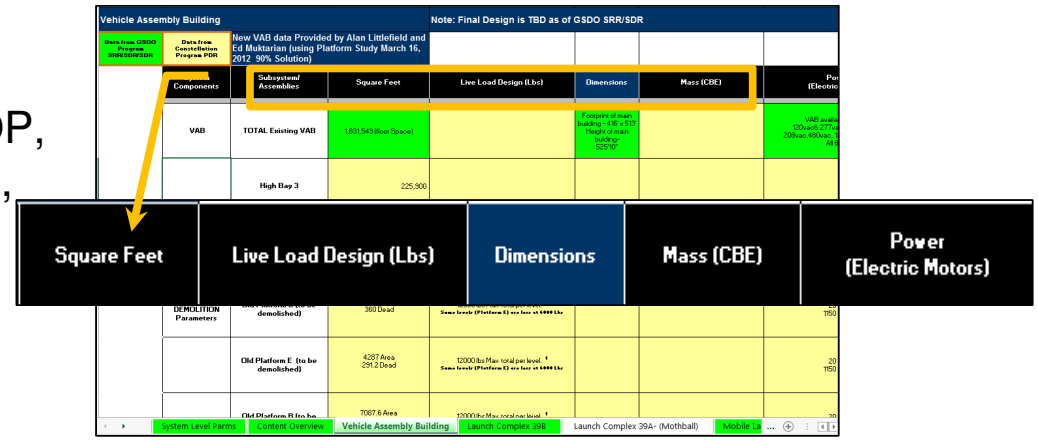
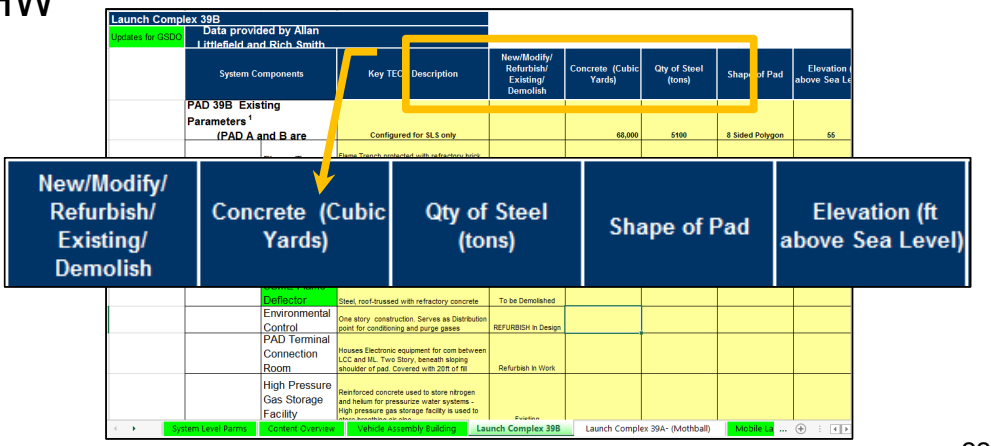
Crewed Data Improvements

- **Current # of Crewed CADRe's in ONCE: 24**
- **Current # of Crewed Projects: 15**
  - C2V2, CxP Ares I, CxP GO, CxP Integ, CxP MOP, CxP Orion, CxP Prog, EFT-1, EVA, GSDO-EGS, ISS Li-Ion, MPCV Orion, NORS, SLS, VCAM
- **Major Challenges:**
  - Inability to query between different projects
  - Minimal data available via ONCE database
  - Added tabs in CADRe Part B for various major HW elements
  - Different technical parameters captured
  - Significant usage of cell comments and "notes"
    - Includes notes on technical information
- **Ongoing Data Expansions:**
  - ISS Modules & Elements





Different tech parameters on tabs for major HW elements

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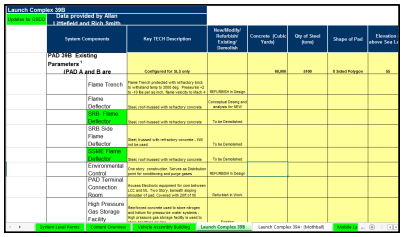
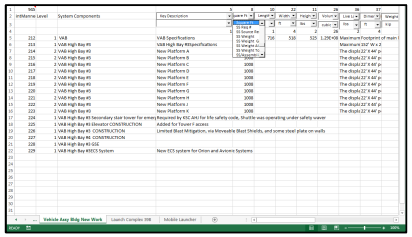
Moving to a Crewed Database

- Data improvement task in 2018 toward a Human/Crewed database
- Historical CADRe's completed detailed review process
- New Human/Crewed CADRe's will utilize improved CADRe template
- New Human/Crewed CADRe's will utilize improved ONCE import
- SQL Server Integration Service (SSIS) leveraged for Extract, Transform, and Load operations (ETL)
- Final result provides end-users with ability to create charts, reports, and queries on all data available in the CADRe

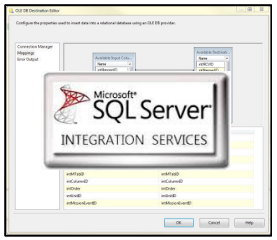
General Workflow Process for New Human/Crewed Capability



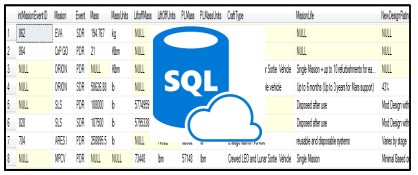
Historical CADRe



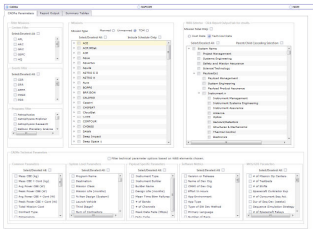
Consolidated File



SSIS Code



New SQL Db



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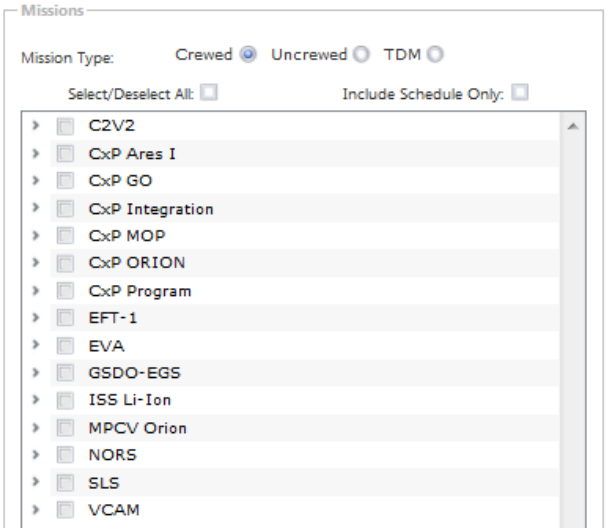
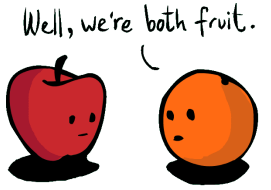
New Crewed Capabilities in ONCE

- **All data is now searchable and reportable in the database**
- **Includes both technical and cost data**
- **All technical fields are now listed**
  - 450 Available Technical Fields with Definition Document
- **Insight into "Element-Level" data for the first time**
  - Previously only available via original CADRe
- **Consistent structure for Crewed CADRe's**
  - Supports development of tables/charts
- **Basic ability to compare across Crewed CADRe's**
  - Launch Vehicle vs Launch Vehicle, etc.
- **New User Dashboards to support filter and export**
  - System Level, CADRe Level, Mass, & Schedule
  - Still very draft, come see more at the Breakout

ONCE User Reports with Crewed db





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DRAFT - Crewed CADRe Interface
CADRe Level

Select the Human Mission CADRe

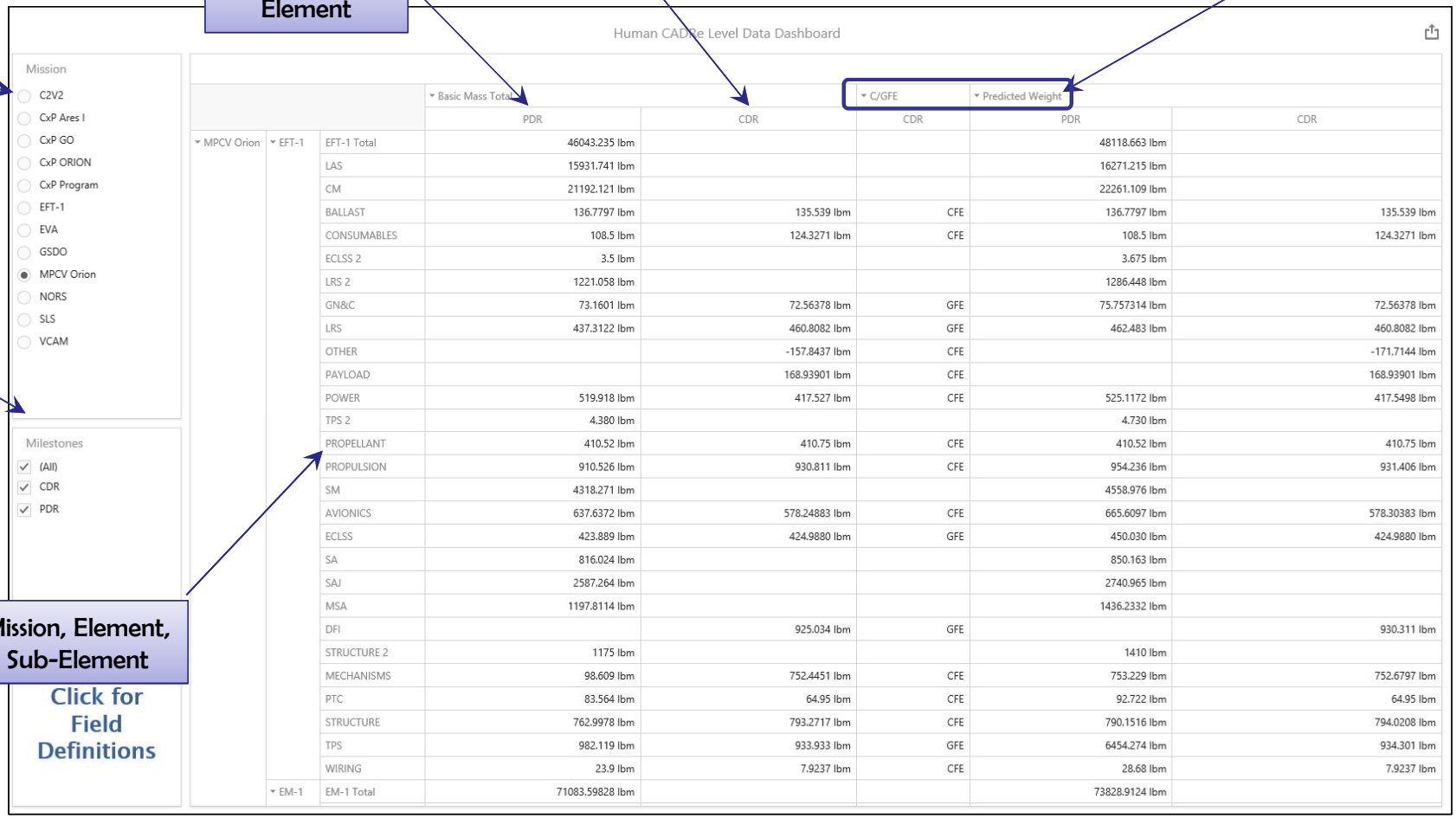
Available Milestones

Mission, Element, Sub-Element

PDR Mass by Element

CDR Mass…

ID other Important Parameters



			Basic Mass Total		C/GFE	Predicted Weight	
			PDR	CDR	CDR	PDR	CDR
MPCV Orion	EFT-1	EFT-1 Total	46043.235 lbm			48118.663 lbm	
		LAS	15931.741 lbm			16271.215 lbm	
		CM	21192.121 lbm			22261.109 lbm	
		BALLAST	136.7797 lbm	135.539 lbm	CFE	136.7797 lbm	135.539 lbm
		CONSUMABLES	108.5 lbm	124.3271 lbm	CFE	108.5 lbm	124.3271 lbm
		ECLSS 2	3.5 lbm			3.675 lbm	
		LRS 2	1221.058 lbm			1286.448 lbm	
		GN&C	73.1601 lbm	72.56378 lbm	GFE	75.757314 lbm	72.56378 lbm
		LRS	437.3122 lbm	460.8082 lbm	GFE	462.483 lbm	460.8082 lbm
		OTHER		-157.8437 lbm	CFE		-171.7144 lbm
		PAYLOAD		168.93901 lbm	CFE		168.93901 lbm
		POWER	519.918 lbm	417.527 lbm	CFE	525.1172 lbm	417.5498 lbm
		TPS 2	4.380 lbm			4.730 lbm	
		PROPELLANT	410.52 lbm	410.75 lbm	CFE	410.52 lbm	410.75 lbm
		PROPULSION	910.526 lbm	930.811 lbm	CFE	954.236 lbm	931.406 lbm
		SM	4318.271 lbm			4558.976 lbm	
		AVIONICS	637.6372 lbm	578.24883 lbm	CFE	665.6097 lbm	578.30383 lbm
		ECLSS	423.889 lbm	424.9880 lbm	GFE	450.030 lbm	424.9880 lbm
		SA	816.024 lbm			850.163 lbm	
		SAJ	2587.264 lbm			2740.965 lbm	
		MSA	1197.8114 lbm			1436.2332 lbm	
		DFI		925.034 lbm	GFE		930.311 lbm
		STRUCTURE 2	1175 lbm			1410 lbm	
		MECHANISMS	98.609 lbm	752.4451 lbm	CFE	753.229 lbm	752.6797 lbm
		PTC	83.564 lbm	64.95 lbm	CFE	92.722 lbm	64.95 lbm
		STRUCTURE	762.9978 lbm	793.2717 lbm	CFE	790.1516 lbm	794.0208 lbm
		TPS	982.119 lbm	933.933 lbm	GFE	6454.274 lbm	934.301 lbm
		WIRING	23.9 lbm	7.9237 lbm	CFE	28.68 lbm	7.9237 lbm
	EM-1	EM-1 Total	71083.59828 lbm			73828.9124 lbm	

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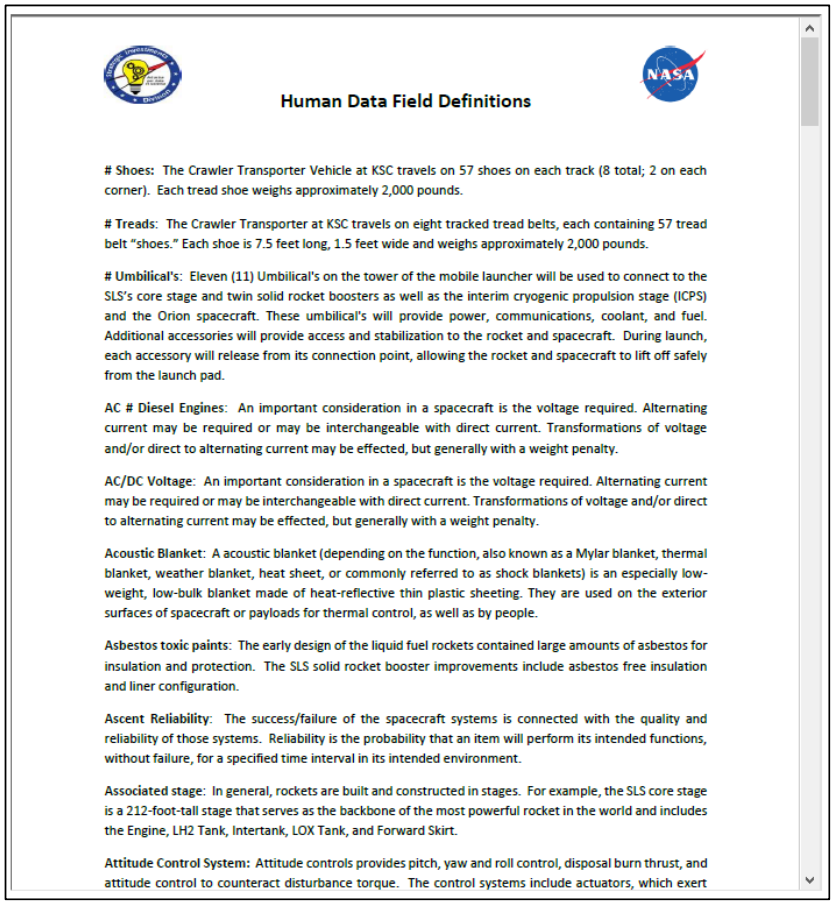
Crewed CADRe Interface
CADRe Level – Field Definitions

- **Document describing all available Crewed data fields with definitions**
  - Work In Progress
- **Come help us fix/improve**
  - ONCE Breakout Session
- **Identify key data fields**
- **Research definitions**
- **Current Draft = 10+ Pgs**



Human Data Field Definitions

 # Shoes: The Crawler Transporter Vehicle at KSC travels on 57 shoes on each track (8 total; 2 on each corner). Each tread shoe weighs approximately 2,000 pounds.

 # Treads: The Crawler Transporter at KSC travels on eight tracked tread belts, each containing 57 tread belt "shoes." Each shoe is 7.5 feet long, 1.5 feet wide and weighs approximately 2,000 pounds.

 # Umbilical's: Eleven (11) Umbilical's on the tower of the mobile launcher will be used to connect to the SLS's core stage and twin solid rocket boosters as well as the interim cryogenic propulsion stage (ICPS) and the Orion spacecraft. These umbilical's will provide power, communications, coolant, and fuel. Additional accessories will provide access and stabilization to the rocket and spacecraft. During launch, each accessory will release from its connection point, allowing the rocket and spacecraft to lift off safely from the launch pad.

AC # Diesel Engines: An important consideration in a spacecraft is the voltage required. Alternating current may be required or may be interchangeable with direct current. Transformations of voltage and/or direct to alternating current may be effected, but generally with a weight penalty.

AC/DC Voltage: An important consideration in a spacecraft is the voltage required. Alternating current may be required or may be interchangeable with direct current. Transformations of voltage and/or direct to alternating current may be effected, but generally with a weight penalty.

Acoustic Blanket: A acoustic blanket (depending on the function, also known as a Mylar blanket, thermal blanket, weather blanket, heat sheet, or commonly referred to as shock blankets) is an especially low-weight, low-bulk blanket made of heat-reflective thin plastic sheeting. They are used on the exterior surfaces of spacecraft or payloads for thermal control, as well as by people.

Asbestos toxic paints: The early design of the liquid fuel rockets contained large amounts of asbestos for insulation and protection. The SLS solid rocket booster improvements include asbestos free insulation and liner configuration.

Ascent Reliability: The success/failure of the spacecraft systems is connected with the quality and reliability of those systems. Reliability is the probability that an item will perform its intended functions, without failure, for a specified time interval in its intended environment.

Associated stage: In general, rockets are built and constructed in stages. For example, the SLS core stage is a 212-foot-tall stage that serves as the backbone of the most powerful rocket in the world and includes the Engine, LH2 Tank, Intertank, LOX Tank, and Forward Skirt.

Attitude Control System: Attitude controls provides pitch, yaw and roll control, disposal burn thrust, and attitude control to counteract disturbance torque. The control systems include actuators, which exert

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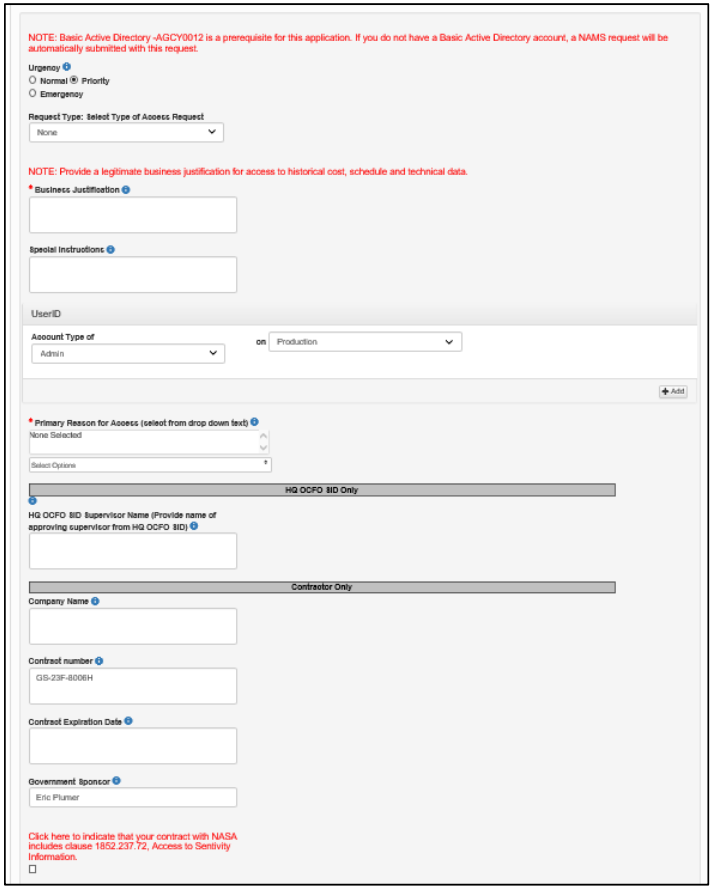
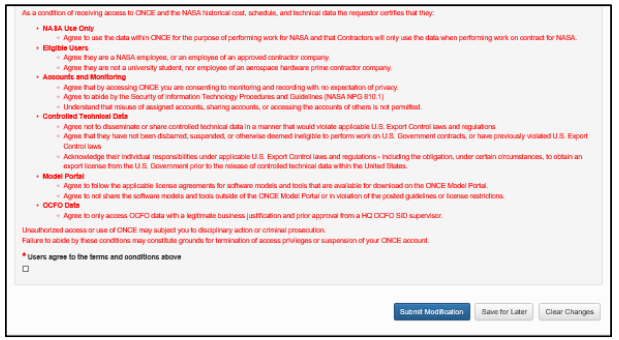
New NAMS Form

The ONCE Access request form in NAMS has been improved over the previous version.

- **Added request type to delineate between ONCE and QUIK users.**
- **Added listing of primary reason for access to ONCE.**
- **Expanded the terms and conditions – specifically addressing unauthorized access to ONCE or data retrieved.**





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CFO SID Only
QUIK – Quarterly Information and KDPs

- **SID previously operated the C&S Db (Cost & Schedule Database)**
  - CAD joined SID in 2016 and began leveraging ONCE to help SID
- **<u>Goal:</u> Utilize capabilities of ONCE to quickly enhance the availability of Project Quarterly data**
- **<u>Source Data:</u> Consolidated Quarterly data sheets by Project**
  - Approximately 51 Projects
  - Quarterly data back to approx. FY2007Q1
  - 964 individual quarterly datasheets
- **<u>What is QUIK?</u> Automated import, analysis, and review of Quarterly Datasheets**
  - Online SQL database that leverages the CADRe/ONCE architecture
  - Supports automated review, import, analysis, and visualization of Quarterly data
  - Provides a controlled and authoritative file library of Quarterlies and other valuable information
  - Multiple dynamic outputs, charts, and dashboards with full export to MS Excel/PDF/Image
  - Integration with NASA IDMax/NAMS and NDC for user credentials and permissions

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QUIK – Automated Review & Import QA

- **QUIK is currently performing 2 primary functions:**
  - Automated Review of new incoming
  - Archive & analysis of historical
- **2-Stage Import Process**
  - Automated Review
  - Import QA
- **AR yields Import Metrics with exceptions flagged**
  - AR Import Metrics Report
- **QA yields quantitative metrics on copy/verification**
  - QA Verification Receipt

Stage 1 Import Metrics Report

QUarterly Information & KDPs (QUIK)
Automated Review Import Metrics Report

FY/QTR	FY17 Q2
# Projects Imported:	40

Summary Count of Exceptions by Lifecycle Phase and Quarterly Datasheet Area

	# of Projects with Exceptions in Summary Area	# of Projects with Exceptions in Cost Area	# of Projects with Exceptions in Schedule Area	# of Projects with Exceptions in Contract Area
Development	0	0	14	0
Formulation	0	0	1	1
Operations	0	0	0	0

Detailed Summary of Exceptions by Lifecycle Phase and Quarterly Datasheet Area

	Summary Exceptions	Cost Exceptions	Schedule Exceptions	Contract Exceptions	Date Loaded	Submittal Date	Template Version	Phase
ASTRO-H			TRUE		5/4/2017	2017-03-22	9	Development
CYGNSS					5/4/2017	2017-04-07	10	Development
Dawn					5/4/2017	2017-03-22	9	Operations
DSAC			TRUE		5/4/2017	2017-03-22	10	Development
Euclid			TRUE		5/4/2017	2017-03-27	10	Development
GEDI					5/4/2017	2017-04-07	10	Development
GPM					5/4/2017	2017-03-22	10	Operations
GRACE FO					5/4/2017	2017-03-22	10	Development
GSDO - EGS			TRUE		5/4/2017	2017-03-31	10	Development
ICESat-2			TRUE		5/4/2017	2017-03-22	10	Development
ICON					5/4/2017	2017-03-22	10	Development
InSight			TRUE		5/4/2017	2017-04-28	10	Development
James Webb Space Telescope			TRUE		5/4/2017	2017-03-31	10	Development
Juno					5/4/2017	2017-04-25	10	Operations
Landsat 8					5/4/2017	2017-03-22	10	Development
Landsat-9					5/4/2017	2017-03-22	10	Formulation
LCRD SCaN			TRUE		5/4/2017	2017-03-22	9	Development
LCRD STMD			TRUE		5/4/2017	2017-03-22	9	Development
LCRD+			TRUE		5/4/2017	2017-03-22	9	Development
Mars 2020 SMD					5/4/2017	2017-03-17	10	Development
Mars 2020+					5/4/2017	2017-03-17	10	Development
MMS					5/4/2017	2017-03-22	10	Operations
NOMM-MS			TRUE		5/4/2017	2017-03-22	10	Development
NISAR					5/4/2017	2017-03-27	10	Development
OCO-3					5/4/2017	2017-03-22	10	Development
Orion Program - Crew Vehicle			TRUE		5/4/2017	2017-03-31	10	Development
OSIRIS-REx					5/4/2017	2017-03-22	10	Operations
Radiation Budget Instrument (RBI)					5/4/2017	2017-04-10	10	Development
Restore-L			TRUE	TRUE	5/4/2017	2017-03-22	10	Formulation
SAGE III					5/4/2017	2017-03-22	10	Development
SMAP					5/4/2017	2017-03-22	10	Operations
SOFIA					5/4/2017	2017-03-22	9	Operations
Solar Orbiter Collaboration					5/4/2017	2017-03-22	10	Development
Solar Probe Plus (SPP)					5/4/2017	2017-03-22	10	Development

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Stage 2 Verification Receipt

QUarterly Information & KDPs (QUIK)
Import QA Verification Receipt

A value of less than 100% indicates that not all data in the datasheet has been correctly copied to the database and verified. Check the Import QA Verification Data tabs in QUIK or the mission specific portions of the Verification Receipt to narrow down the specific field which was not copied correctly. Data that is not in the correct format will not be copied correctly (e.g. Text in place of Date, Text in place of Number).

FY17 Q2

Quarterly Summary Verification %: 72.2% 40 Total Projects

Average Verification Percentages by Lifecycle Phase and Quarterly Datasheet Area

	Summary	Cost	Sch-Milestone	Sch-Mgmt	Sch-Agency	Contract	Total
Development	73.6%	100.0%	71.2%	84.4%	77.4%	32.6%	73.2%
Formulation	75.0%	100.0%	76.9%	88.5%	61.5%	97.2%	83.2%
Operations	67.7%	100.0%	33.3%	66.3%	66.3%	33.3%	63.6%

Detailed Summary of Verification Percentages by Quarterly Datasheet Area

	Summary	Cost	Sch-Milestone	Sch-Mgmt	Sch-Agcy	Contract	Total
ASTRO-H	66.7%	100.0%	5.6%	88.9%	88.9%	0.0%	58.3%
CYGNSS	66.7%	100.0%	92.3%	92.3%	92.3%	0.0%	73.9%
Dawn	66.7%	100.0%	84.6%	84.6%	30.8%	0.0%	61.1%
DSAC	58.3%	100.0%	57.1%	35.7%	0.0%	0.0%	41.9%
Euclid	66.7%	100.0%	23.1%	76.9%	76.9%	0.0%	57.3%
GEDI	66.7%	100.0%	92.3%	92.3%	92.3%	0.0%	73.9%
GPM	66.7%	100.0%	61.5%	23.1%	23.1%	100.0%	62.4%
GRACE FO	66.7%	100.0%	100.0%	100.0%	100.0%	0.0%	77.8%
GSDO - EGS	100.0%	100.0%	0.0%	84.6%	84.6%	100.0%	78.2%
ICESat-2	83.3%	100.0%	76.9%	92.3%	76.9%	94.4%	87.3%
ICON	66.7%	100.0%	84.6%	84.6%	84.6%	0.0%	70.1%
InSight	66.7%	100.0%	84.6%	84.6%	84.6%	100.0%	86.8%
James Webb Space Telescope	66.7%	100.0%	46.2%	46.2%	76.9%	100.0%	72.6%
Juno	66.7%	100.0%	76.9%	76.9%	76.9%	66.7%	77.4%
Landsat 8	66.7%	100.0%	100.0%	100.0%	100.0%	0.0%	77.8%
Landsat-9	66.7%	100.0%	100.0%	100.0%	100.0%	100.0%	94.4%
LCRD SCaN	83.3%	100.0%	84.6%	84.6%	23.1%	0.0%	62.6%
LCRD STMD	83.3%	100.0%	84.6%	84.6%	23.1%	0.0%	62.6%
LCRD+	75.0%	100.0%	84.6%	84.6%	23.1%	0.0%	61.2%
Mars 2020 SMD	83.3%	100.0%	100.0%	100.0%	100.0%	88.9%	95.4%
Mars 2020+	75.0%	100.0%	92.3%	100.0%	100.0%	0.0%	77.9%

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